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Do vaccines protect from long COVID?

On Jan 6, 2022, the UK Government's Office of National Statistics (ONS) published their latest report on the prevalence of long COVID in the UK from a representative survey. As of Dec 6, 2021, around 1·266 million people living in the UK had self-reported long COVID (95% CI 1·228–1·304; 2% of the total population), defined as symptoms persisting for more than 4 weeks after the first confirmed or suspected COVID-19 infection. Of these individuals, 892 000 (70%) had confirmed or suspected COVID-19 at least 12 weeks previously. Fatigue was the most common symptom reported, followed by loss of smell, shortness of breath, and difficulty concentrating.

The numbers in the ONS report are high enough to give pause for concern, particularly as long COVID was reported in all sub-populations, including around 77 000 children aged 2–16 years and 134 000 people aged 17–25 years. Yet there is still uncertainty about the true prevalence of long COVID in adults and children following infection. A previous ONS article suggested that, of individuals who tested positive for COVID-19 infection in the UK between April, 2020, and August, 2021, between 3% and 12% had new or ongoing symptoms 12 weeks after the initial infection, including people who were not symptomatic during the acute phase.

Part of the problem with assessing the prevalence of long COVID is an absence of consistent information on terminology, definitions, and diagnosis of the condition. For example, a guideline from the UK National Institute for Clinical Excellence (NICE) defines long COVID as signs and symptoms that continue or develop after acute COVID-19 from 4 weeks onwards, whereas WHO uses the term post COVID-19 condition, defined as occurring in individuals

3 months from the onset of SARS-CoV-2 infection. Additionally, a substantial proportion of patients might have persistent symptoms for a year or more after infection; more than half a million individuals (40%) from the January 2022 ONS report who described having long COVID had been infected at least 1 year ago. However, the general consensus is that long COVID is the failure to return to normal, pre-COVID levels of health, and is surprisingly common. More research is needed to gauge the full spectrum of symptoms of long COVID to facilitate diagnosis of the condition; as well as fatigue and shortness of breath, the NICE guideline lists many other commonly reported symptoms including palpitations, neurological symptoms such as dizziness, and gastrointestinal symptoms including nausea and weight loss. As Annelise Wilder-Smith (London School of Hygiene & Tropical Medicine, London, UK) commented "Long COVID is so much more than just chronic fatigue, and ranges from reduced stamina for athletes to erectile dysfunction in young men." Research is also needed to understand why after acute COVID-19 infection, the impact of the disease varies from patient to patient, from full recovery to severe persistent symptoms affecting multiple organs and mental health. Anthony De Soyza (National Institute of Health Research Newcastle Biomedical Research Centre, Newcastle University, Newcastle, UK) commented "Long COVID can arise in people who had mild acute COVID [and] so can affect anyone. Long COVID affects people differently and might well be a number of distinct subtype[s], each requiring better understanding of what causes the particular symptoms and how best to treat—this requires ongoing research." Wilder-Smith added "Long COVID may be due to persistence of

the virus, an autoimmune response, or damage triggered by the acute illness, but we need more data to answer this question."

The data on long COVID are worrying, particularly during the current increase in global cases of COVID-19 infection. There are, however, encouraging emerging data that individuals who are vaccinated against COVID-19 are less likely to report long COVID symptoms. For example, a case-control study of 1·2 million users of a COVID symptom tracker app in the UK showed that there were lower odds of symptoms lasting 28 days or more in individuals who had received two vaccine doses (odds ratio 0·51 [95% CI 0·32–0·82]; $p=0·0060$)—ie, the risk of developing long COVID was reduced by around 50% in those who were double vaccinated. Wilder-Smith said "Even if COVID-19 did not cause deaths, the high morbidity as a result of this viral infection would justify vaccinating all. The reasons for vaccination beyond the most pressing need to avert severe disease and deaths are manifold, but foremost it is to prevent long COVID." De Soyza added "Ideally preventing both acute severe COVID through vaccination and also reducing the chances of long COVID represents an additional driver to support people to get vaccinated."

Priya Venkatesan



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For the **ONS report on UK prevalence of long COVID** see <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/prevalenceofongoingsymptomsfollowingcoronaviruscovid19infectionintheuk/6january2022>

For **long COVID statistics in children** see <https://post.parliament.uk/long-covid-the-long-term-health-effects-of-covid-19/>

For the **ONS article on prevalence of long COVID in those who test positive** see <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/articles/technicalarticleupdatedestimateofthe prevalenceofpostacute symptomsamongpeoplewith coronaviruscovid19intheuk/26april2020to1august2021>

For the **NICE guideline on long COVID** see <https://www.nice.org.uk/guidance/ng188/resources/covid19-rapid-guideline-managing-the-longterm-effects-of-covid19-pdf-51035515742>

For the **WHO definition of long COVID** see https://www.who.int/publications/i/item/WHO-2019-nCoV-Post_COVID-19_condition-Clinical_case_definition-2021.1

For the **case-control study** see **Articles** *Lancet Infect Dis* 2022; 22: 43–55

